PROJECT TITLE: TI-04

REQUEST FOR QUOTES – PHASE II

DATE: 9-26-2003

The Department of Defense (DoD) High Performance Computing Modernization Program (HPCMP) is seeking final quotes for HPC systems and associated maintenance against GSA Schedule 70 contracts to address HPC requirements for its user base of scientists and engineers across the HPCMP Major Shared Resource Centers (MSRCs) (and potentially other selected HPCMP related activities). Using benchmark and pricing data previously provided, the Government has identified several options containing system configurations across the MSRCs for which a quote is requested. A key factor in evaluating the final quote will be the guaranteed execution times for benchmark programs and data sets provided by the HPCMP. The offeror is strongly encouraged to propose additional (or more advanced) equipment beyond that requested in this RFQ, which will minimize the time to completion for these benchmark programs. Note that a single suite of systems will be procured (that suite of systems spans the two MSRCs and other potential activities), and may include systems from multiple offerors which may include one, or several options from those listed below. Since the Government may purchase none, or some combination of the items identified below, please provide any tier pricing points (e.g., XX% discount at $5–10 million, YY% discount at $10–20 million, etc.) that apply to this potential purchase. **You are strongly encouraged to provide your best updates to all benchmark timings provided in response to the first RFQ and provide your most competitive pricing in the response to this RFQ to increase the likelihood that an option from your response is selected and purchased.** The Government reserves the right to make no award from this RFQ.

INFORMATION REQUIRED IN FINAL QUOTES

Offerors are requested to provide detailed pricing and hardware/software configurations and maintenance for balanced HPC systems (see paragraph 7 of Attachment 1) that meet or exceed the DoD Standard Performance Requirement (SPR) as identified in the benchmarking instructions on the HPCMP website (http://hpcmo.hpc.mil). The requested alternatives are listed below. Offerors may offer other alternatives, including trade-ins and incentive pricing. The following existing equipment is available for trade-in. Please contact the GSA Contracting Officer, _____, at the address below if any questions arise concerning the offering of trade-in credits for any or all of this equipment:

Note: The names of the DoD HPCMP Office and Center representatives have been removed from this web-page version of the TI-04 Phase 2 RFQ for security reasons. Please call the TI-xx Acquisition Team Lead at the DoD High Performance Computing Modernization Program Office, at (703) 812-8205, for the representatives' names.

Equipment located at Aberdeen Proving Ground MSRC:

SGI Origin 3800 system
- 512 CPUs
- GigE Interface
- NO DISKS
- Irix S/W and O/S
- MIPS Pro Compiler

Equipment located at Aeronautical Systems Center MSRC:

IBM SP3
- 528 CPUs (512 processors are compute processors)
- 528 GB memory
- NO DISKS
- Gig E, ATM network interfaces
- AIX operating system
- Standard Compilers – C, C++, F77

Equipment located at Naval Oceanographic Center MSRC:

CRAY SV1
- 32 CPUs (1 node cabinet)
- 32 GB memory
- Hippi interface
- Fast Ethernet interface
- NO DISKS
- Unicos O/S & layered software

CRAY SV1ex
- 32 CPUs (3 node cabinets)
- 96 GB memory
- 96 GB SSD
- Hippi interface
- NO DISKS
- Unicos O/S and layered software

NOTE: The above equipment cannot be released before 15 Oct 2004.

All offers shall consist of commercially available products that are or will be on a GSA Schedule 70 contract(s) prior to award (Estimated to be December, 2003. All open market items should be marked as such. All open market items in excess of $2,500 are subject to the applicable Federal Acquisition Regulations (FAR).

Quotes Requested

Balanced systems are discussed in Attachment 1, Paragraph 7. Quotes are requested for system(s) with sufficient resources to execute your guaranteed DoD benchmark timings and your guaranteed fully loaded system timings. This is considered the "base" system. In addition quotes are requested for systems with 2X the base memory in conjunction with the necessary resources to keep such systems balanced. It is also requested that a definition of the resources (or portions of the configuration) specifically available for application processing be identified; i.e. the total system less resources dedicated to system functions. Note that the DoD will provide a queuing and scheduling system for the delivered system. Tiered pricing discounts based upon volume purchases are encouraged.

System Description

See Attachment 5.

Terms and Conditions

Terms and Conditions are provided as Attachment 1.

Testing

Requirements for successful completion of Effectiveness Level Testing and Capability Testing are the responsibility of the offeror and are provided in Attachment 2.

Warranty and Maintenance

Information concerning and requirements for warranty and maintenance are provided in Attachment 3.

MSRC Networking Infrastructure

Information outlining the networking infrastructures at the MSRCs is provided in Attachment 4.

Quote Pricing Structure

The pricing quote for each option should include the total life cycle costs for the proposed system(s) in that option. Assume a 42-month operational life for new, expanded, and upgraded systems. The pricing quote should be structured as an initial purchase price and three one-year and one six-month options for monthly maintenance and Other Support. (Should the offeror elect to provide a warranty for a system, maintenance costs will be assumed to be the monthly maintenance costs commencing immediately following the end of the warranty period pro-rata to the end of that option year.) If an existing system is being expanded or upgraded, composite maintenance for the entire resulting system should be quoted. To provide the Government flexibility for system phase-out, provide a monthly maintenance price for periods beyond the 42-month operational life. For each option proposed, provide pricing and performance data as follows in the tables below:

		Total maintenance price after expiration of warranty ($K)			
	Purchase ($K)	Months 1–12	Months 13–24	Months 25–36	Months 37–42
New, expanded/ upgraded systems provided at *	$xxx				
HW Maintenance		$xxx	$xxx	$xxx	$xxx
SW Maintenance		$xxx	$xxx	$xxx	$xxx
Total	$xxx	$xxx	$xxx	$xxx	$xxx

* Purchase price for all systems at an HPC Center, including trade-in allowances or credits. It is desirable that individual systems be separately priced in each pricing quote in the proposal, but not required. If existing systems are being upgraded, maintenance pricing should be for the total costs of the upgraded systems, not for the incremental costs of the upgrade. Other support costs, such as operating system and other software licenses, system specific support equipment, personnel, acceptance testing, and any other items needed to provide a balanced HPC system shall also be included in the purchase and/or maintenance price.

Percent Proposed Effectiveness Level Per Month	Proposed Maximum Number of Failures Per Month
X%	X

The vendor is required to provide a guaranteed uptime percentage (97% minimum) and a guaranteed minimum number of failures per month. These indicators of reliability are important to the HPMCP and will be considered as part of the selection criteria and be used post-award as the threshold to measure effectiveness level and operational interrupt performance.

When purchasing an option offered by the proposal, the Government may choose to purchase the Maintenance items for the selected option via contracts placed by the Government's Technical Services contractor at each HPC Center. For this reason, it is required that all maintenance pricing and associated terms and conditions offered to the Government also be offered to the Government's Technical Services contractor at each HPC Center for maintenance to be provided at that HPC Center.

At the time of purchase of an option offered by the offeror, the pricing for maintenance items must be provided in greater detail, with a separate line item for each system sufficient to enable the Government, or the Government's Technical Support contractor at each HPC Center, to establish and administer the resulting site-specific contracts for maintenance over the life of those contracts. If the maintenance items are purchased via a contract directly placed with the offeror by the Government, the Government may, by written notice from the Contracting Officer, discontinue maintenance, at no cost to the Government, thirty (30) days after receipt by the offeror of such notice, or sooner if mutually agreeable to the parties. Such discontinuation may be on a per-piece or per-system basis.

HPC systems delivered in response to this solicitation are required to support IPv4 and IPv6 dual stack functionality.

Offerers are advised that, prior to contract award, they will be required to provide evidence that they have initiated the process of obtaining EAL 3 Information Assurance certifications of the operating system(s) offered in response to this solicitation.

REQUIRED DATE FOR RESPONSES TO RFQ. Not later than 1200 Noon (in the recipients respective time zone), 17 October 2003, per the following table (the first number in each column is the number of CD copies to be provided, the second is the number of hard copies to be provided. Please do not include any pricing information in any of the submissions with the exception of the "pricing data" submission. If configuration details are included with pricing data that is not included in the proposal or benchmark materials, please include this information along with the proposal and benchmark materials with the pricing data removed.

Address	Benchmark Materials*	Proposal Less Pricing Data	Pricing Data
Name removed for security reasons	1/1	1/1	1/1
Name removed for security reasons	1/3	1/3	1/3
Name removed for security reasons	1/0	2/0	—
Name removed for security reasons	1/0	2/0	—
Name removed for security reasons	1/0	1/0	—
Name removed for security reasons	1/0	2/0	—
Name removed for security reasons	1/0	1/0	—

Address	Benchmark Materials*	Proposal Less Pricing Data	Pricing Data
Name removed for security reasons			
	1/0	—	—
Name removed for security reasons	1/0	—	—

*Includes any updates or additions to benchmark timings delivered in response to the initial RFQ (Phase I), and guaranteed timings on loaded systems requested in the final RFQ (Phase II).

Responses should be limited to ten pages (excluding attachments such as Bills of Materials) for each option and should include all salient terms of the proposal.

ATTACHMENT 1

TERMS AND CONDITIONS

1. General terms and conditions are as listed in the basic GSA Schedule 70 Contract. This document reflects a further refinement of the Government's requirements. Should a conflict in interpretation arise with this document, the order of priority is this document and then the basic GSA contract.

2. The Government is seeking independently priced quotes for the options listed in the body of the RFQ.

For each option listed in the body of the RFQ, provide the following information:

- An overview of the system configurations included in that option, including at least the number of processors, memory configuration, disk configuration, network interfaces, and any major vendor and third-party software provided with the system. Where trade-ins are involved, the system configuration that is being traded in should be described to the same level of detail, and the MSRC where the trade-in is currently located identified.

For each system proposed as part of your response, provide the following information:

- Execution times for data sets provided by the HPCMP and selected by the offeror in accordance with guidance provided in paragraph 9 below.
- Complete Bill of Material (BOM) for the proposed configuration including all support equipment and software hardware.
- System facility requirements including realistic estimates for power consumption, ambient/liquid cooling requirements, intake and exhaust air flows, wiring/cabling considerations, floor loading, and floor/underfloor space requirement for all proposed equipment.
- Configuration drawings.
- Proposed delivery date

Balanced systems are discussed in paragraph 7 below. Should any items required for a fully functional system not be included in the BOM for a system, such items will be included in the final system configuration at no additional cost to the Government.

3. Should a quoted option be selected and purchased, the offeror will be responsible for delivery of the systems in that option to the designated HPC Centers, and for removal of any systems identified in that option for trade-in from the HPC Centers where presently located. All shipping costs, for all systems involved, and the cost of preparing the trade-in system for shipping, are the responsibility of the offeror and are to be included as a part of the price for that option in the quote. Any dependencies between or among the timing of delivery of the new system(s), timing

of de-installation of the trade-in systems, and the affect (if any) on the pricing of a quoted option if the timing of the de-installation of the trade-in systems cannot be met by the Government are to be included in the quote.

4. Use of trade-ins and upgrades in the quote are allowed. HPCMP user requirements are being addressed at the program, rather than the specific HPC Center level; therefore, quotes may include options of trade-ins of one HPC Center's equipment for purchase of systems to be delivered at another HPC Center. Offerors are not limited to proposing the presently installed HPC systems of their own manufacture as trade-ins.

5. Effectiveness Level Testing and Capability Testing completion are the responsibility of the offeror (with Government oversight). The requirements for the ELT and CT are described in Attachment 2. A Capability Test Plan must be provided to the Government subsequent to receipt of an order as described in Attachment 2.

6. System maintenance is to be provided as shown in Attachment 3. Warranty period (if any) shall not commence until successful completion of Acceptance Testing as described in Attachment 2. Warranty terms are discussed in Attachment 3. Maintenance charges will commence upon expiration of the Warranty period (if any), or upon successful completion of the Acceptance Testing (if no warranty is proposed).

7. Offerors must propose balanced HPC systems. Balanced HPC systems are considered to be those with the appropriate combinations of processors, memory, I/O, internal and networking communication, and on-line storage that fully satisfy both system and user needs—all permitting the system to sustain processing operations at high levels of system utilization for the DoD HPCMP workload as described in the initial RFQ and characterized by the previously distributed benchmark suite. Balanced systems can generally be considered as those having features and configurations similar to the larger HPC systems currently installed at the MSRCs. If an existing system is being upgraded or expanded, the resulting system should be configured as a balanced system. Maintenance costs and all other costs to provide an operational system should be included. If a warranty is included, the duration, terms and conditions of the warranty should be stated. Additional maintenance and warranty terms and conditions are shown as Attachment 3. Note that the DoD will provide a queuing and scheduling system for the delivered system

8. Delivery of proposed systems is generally expected to occur prior to 30 June 2004, but a waiver may be requested if significant additional capability can be delivered after that date. In no case can the system be delivered later than 30 September 2004. If a proposed system is not fully delivered within the interval after receipt of order specified in the proposal, the Government's consideration will be four (4) percent of the system acquisition cost (or other consideration at the sole discretion of the Government) per month (pro-rata to a maximum of 24%) until the system is fully delivered. Should the offeror propose a phased delivery, the proposal should address how ELT and Capability Tests would be accomplished and how payment terms, maintenance pricing, and any warranty periods would be modified consistent with the additional risks the Government would assume. The pricing quote for an option containing a phased delivery must include the cost of both the interim and final systems in the initial system acquisition price.

9. Guaranteed benchmark execution times must be provided in the proposal for each system proposed, and should be stated in terms of maximum wall clock execution times for completion of each of the benchmark programs, when executed in dedicated mode. These are the maximum times for completion that the offeror guarantees will be observed for a proposed system when they are executed on the system after installation at the MSRC. These benchmark programs are a subset of the benchmark suite previously provided in conjunction with the initial RFQ issued by GSA on 27 June 2003. In addition to the application and synthetic benchmark code timings provided in response to the first RFQ (and any updates to these provided in response to this RFQ), the vendor will be required to guarantee certain application benchmark times on a loaded system. These guaranteed times on a loaded system will be verified as part of the acceptance tests. The specific application test cases to be timed include the large test cases for RFCTH, Cobalt, Gamess, OOcore, HYCOM, and NAMD. Six loaded system tests will be run independently, one for each of the application benchmark identified above. A loaded system on the proposed configuration is defined as running multiple copies of each test case independently in the following manner. Four copies will be sized so that at least 75%, and then 90%, in a separate run, of the delivered system is loaded. The copies should be started nearly simultaneously and run to completion. Time to completion for each of the four copies will be measured independently. The benchmark time to be compared with the vendor guaranteed time will be the average of the times of the four copies. For example, if the proposed system configuration contains 512 CPUs, four identical 98-CPU test cases, and then four identical 115-CPU test cases, of each of the application codes would be run in the prescribed manner. Vendors will be required to run test cases on the complete node of an SMP system before using processors from an additional node. For example, if a vendor offers a system with 16-processor nodes, a 128-processor test case would be required to run across no more than eight nodes of that system. The submission of the jobs associated with the fully loaded system tests can be executed independent of the government supplied queuing and scheduling system.

10. Each provided system is required to meet the benchmark execution times guaranteed in the proposal as a part of the required Capability Test after installation of the system. (The provided system must be configured for production use at the site when running the Capability Test.) If a system is unable to do so (or in the case of a phased delivery, if either the initial or final system is unable to meet the respective benchmark execution times), the Government may reject the system and the offeror will be responsible for the cost of restoring the MSRCs facilities and computers to their pre-installation configuration. Should additional equipment be required to meet the guaranteed benchmark execution times, this additional equipment will be provided by the offeror at no cost to the Government and included under the related maintenance contract at no additional life cycle cost to the Government.

11. For each system provided, expanded, or upgraded as part of any option in the proposal, the facility requirements (space, power, cooling, electrical connections, and the like) must be described (see paragraph 1 above). This description should be in sufficient detail to permit the Government to price any required facilities modifications and enable installation of the system at the MSRC. Information to assist in configuring systems contained in the proposal to ensure interoperability with the existing networks at each MSRC is provided in Attachment 4.

12. Current Technology Substitutions/Additions. The Contractor, upon commercial announcement of new components that can be technically and economically substituted for, or added to, items identified in the Contractor's proposal, shall offer said items for addition or substitution. These item(s) may be accepted at the option of the Government, provided at least equivalent performance with economic benefits or significantly enhanced performance is achieved.

13. Warranty Provisions.
a. Any provided warranty shall commence upon the first day after the successful completion of acceptance testing as described in Attachment 2. Any maintenance (to include parts) performed prior to this period shall be furnished at no cost to the Government.

b. Defective parts which cannot be released due to security regulations (ex. contain sensitive data) and which are replaced during the warranty period shall remain the property of the Government. The Government shall incur no additional costs related to retention of such parts. All other defective parts which are replaced during the warranty period shall become the property of the Contractor.

c. Prior to the expiration of the warranty period, whenever equipment is shipped for mechanical replacement purposes, the Contractor shall bear all costs, including, but not limited to, costs of packing, transportation, rigging, drayage and insurance.

d. The warranty shall not apply to maintenance required due to the fault or negligence of the Government.

14. Risk of Loss Or Damage. The Government is relieved from all risks of loss or damage to purchased equipment during periods of transportation, installation, and prior to completion of the Effectiveness Level Test, except when loss or damage is due to the negligence of the Government.

15. Maintenance Credits. A maintenance credit of 100% will be taken when the system availability falls below the guaranteed level (minimum acceptable is 97%), or the number of operational interrupts per month exceeds that guaranteed by the offeror. See attachments 2 and 3 for a full description of the maintenance terms.

16. Section 508 Compliance. All information technology products acquired or developed by a federal agency after June 25, 2001, must be compatible with accessories that permit people with disabilities to use that equipment. While agencies do not have to install assistive devices and technology in their offices until an employee with disabilities needs it, any electronic and information technology (EIT) equipment purchased after June 25, 2001, must meet specific standards so assistive devices can be attached if needed. Therefore, all EIT equipment delivered under this order, must meet the applicable accessibility standards at 36 CFR 1194. 36 CFR 1194 implements Section 508 of the Rehabilitation Act of 1973, as amended, and is viewable at http://www.section508.gov/accessible.html (FAR Part 39.2)

17. Additional Clauses – Incorporated by Reference

All FAR Clauses from the GSA Schedule are incorporated into this RFQ. The following additional FAR and DFAR Clauses are incorporated by reference:
FAR:

52.227-14	Rights in Data – General, Alternates I, II, III, IV and V	(JUNE 1987)

DFAR:

252.227-7015	Technical Data – Commercial Items	(NOV 1995)
252.227-7019	Validation of Asserted Restrictions – Computer Software	(JUNE 1995)
252.227-7025	Limitations On The Use Or Disclosure Of Government-Furnished Information Marked With Restrictive Legends	(JUNE 1995)
252.227-7030	Technical Data – Withholding of Payment	(MAR 2000)
252.227-7034	Patents – Subcontracts	(APR 1984)
252.227-7037	Validation Of Restrictive Markings On Technical Data	(SEPT 1999)

ATTACHMENT 2

ACCEPTANCE TESTING

1. General.

As part of the acceptance process after installation of a system, the offeror will be required to complete two acceptance tests. The offeror shall provide an Acceptance Test Plan which describes how these tests will be conducted. This plan will be provided at least 30 days prior to the offeror's intent to begin testing. The Effectiveness Level Test (ELT), as described in paragraph 2 below, will be the first test run by the Government or the Government's agent upon installation of a system. The Capability test (CT), as described in paragraph 3, shall begin after commencement of the ELT and finish prior to conclusion of the ELT. Acceptance of equipment by the Government is described in Sections 6 and 7 below.

The purpose of the ELT is to demonstrate that the system being purchased by the Government has been delivered in full and is reliable in accordance with the effectiveness level requirement; i.e. runs for thirty (30) consecutive days at or above the offeror's proposed level of reliability. The purpose of the CT is two-fold. First, to demonstrate that all components of a system can function as an inter-working system and second, to verify that the inter-working system can produce the benchmark execution times guaranteed in the proposal. In general ELT lasts thirty (30) days (unless an extension is required to achieve the required effectiveness level) and the CT can last up to 5 working days.

Consistent with the above-specified purposes for the ELT and CT, the Government desires to minimize, where appropriate and possible, the length of time between delivery of the proposed system and placing it into operational use within the MSRC. Accordingly, offerors will permit access to and use of the system by designated MSRC personnel prior to and during the ELT. It is recognized that such access and use needs to be explicitly approved by and coordinated with the offeror in advance of such access or use.

2. Effectiveness Level Testing.

For the purpose of the Effectiveness Level Test, equipment and system software shall be considered one system.

a. Starting ELT. The formal Effectiveness Level Test shall not begin until the offeror has certified in writing to the Government or the Government's agent that all offeror-proposed hardware and software have been fully installed are fully functional, and that the system is ready to begin ELT. The Government shall have a maximum of five (5) working days after the system is certified as ready and the CT plan is approved by the HPCMP to approve start of the ELT.

For the system to be ready for ELT, the offeror shall be responsible for:

1. Assuring all hardware and software are installed and configured to support a production environment (with assistance from the site staff as appropriate).
2. All software required to successfully run the HPCMP benchmarks
3. Successful completion of HPC Linpack using all proposed computational nodes with the results provided to the Government.

Prior to ELT, the Government will provide:

Site preparation including power, cooling, and networking cabling

During ELT:
The offeror will allow the Government to install 3rd party software.

b. Performance Period. The performance period for ELT shall begin at a time mutually agreed upon by the offeror and the Government after receipt of the offeror's written certification, completion of the HPC Linpack execution, and the Government's concurrence with the offeror's request to begin ELT. The performance period shall end for a system when the system and each piece of equipment contained therein, has met the Effectiveness Level and has experienced a number of Operational Interruptions less than or equal to the proposed maximum number of Operational Interrupts for the preceding thirty (30) consecutive days. If the system, or any piece of equipment contained therein, does not meet the Effectiveness Level or experiences a number of operational interrupts higher than proposed during the initial thirty (30) consecutive days, the performance period for that system may be extended on a day-by-day basis. However, if the required extension is more than ninety (90) consecutive days after commencement of ELT for the system configuration proposed (either the only ELT for a system, or the second ELT for a final system in a phased delivery, see paragraph 8 of Attachment 1of this RFQ), the Government may unilaterally reject the system being tested. The offeror will be responsible for the cost of restoring the MSRCs facilities and computers to their pre-installation configuration.

c. Effectiveness Level Calculation. For the purpose of the Effectiveness Level Test, the effectiveness level (EL) shall be computed for each offeror-furnished system as follows:

$$EL = 100 * \frac{\text{Operational Use Time (hours)}}{\text{Scheduled Use Time (hours)}}$$

Only the integer portion of the above computed EL will be retained. Existing equipment will be subject to effectiveness level testing only when offeror-furnished additions or alterations are integral to the existing equipment and it can not be easily determined that the downtime is due to failure of the existing equipment. Otherwise, only the TI-04 offeror-furnished system shall be subject to effectiveness level testing.

The furnished system(s) and each piece of equipment therein shall operate for a period of thirty (30) consecutive days during the Performance Period of the ELT at a minimum Effectiveness Level of 97%, unless the offeror proposes to meet a higher Effectiveness Level. In that case, the system must meet or exceed the proposed effectiveness level. A system will be considered down for an entire hour if it is down during any portion of that hour. In the Effectiveness Level computation, time shall be measured in 60 minute intervals.

d. Operational Interrupt: For the purposes of ELT, an Operational Interrupt is defined as the failure of one or more system components, including software, which result in the failure of a user job or could result in the failure of the user job (includes failures of a node or nodes and all associated hardware and software that is executing a user job or is available to execute a user job (e.g. an idle computational node).

e. Operational Use Time: For the purposes of Effectiveness Level Testing, a system is considered Operationally Usable if it is capable of simultaneously running a selection of the seven (7) TI-04 application benchmarks sufficient to utilize at least 75% of the system. The benchmarks must be able to be submitted to the installed queuing software by a remote interactive login which has no system level privileges. Operational Use Time are those hours during the preceding thirty (30) consecutive days when the offeror furnished system is Operationally Usable during an entire clock hour. (The minimum time segment which may be considered operationally usable is four (4) hours.

f. Scheduled Use Time: For the purpose of the Effectiveness Level Test, Scheduled Use Time is 720 hours less Excusable Delays during the preceding thirty (30) consecutive days.

g. Excusable Delays. In addition to the Excusable Delays set forth in FAR Clause 52.212-4, the following periods of time are Excusable Delays:

1) Periods during which the system is not performing due to planned outages which have been approved and scheduled in advance by the Government's COTR or other designated Government representative.

Periods during which the system is not performing due to Government-attributable causes, such as loss of Government-provided electrical power.

h. Delay of Start of Performance Period. Should it be necessary, the Government may delay the start of the performance period (after approval of the CT test plan), but such delay will not exceed five (5) working days. Thus, the performance period shall start no later than the sixth (6th) working day after the system is installed and ready for the ELT in accordance with paragraph 2a. above.

i. Additional ELT Requirements

1) Added System Elements. Systems or single hardware items which are to be added, substituted, or installed by the offeror, may at the option of the Government, be subject to a new thirty (30) day Performance Period which is independent of other system elements.

2) Daily Record: The Government or designated representative will maintain appropriate daily records of system and equipment effectiveness levels.

3) Access to and Use of System. Where possible, the offeror is requested to permit designated Government and contractor personnel access to and use of the system before and during the ELT period, in order to perform site-specific integration activities (examples would include job scheduler installation and configuration, and application software installation) and to exercise system functionality that will ultimately be available for use by the HPCMP users when the system is placed into operation.

4) System Utilization Requirement. The system must achieve a minimum utilization of 50% of the scheduled CPU hours (scheduled use time* number of computational CPUs * 0.5). The CPU hours utilized will be determined from either system activity reporter

(SAR) or system accounting records. The ELT workload proposed to meet this minimum utilization requirement must be approved by the Government .

3. Capability Testing.

a. Starting Capability Testing. The Capability Testing is conducted during the Effectiveness Level Test. The offeror is responsible for submitting a Capability Test Plan to the Government. The Test Plan shall include the testing of the integrated system including the benchmark performance tests. The Government typically has an independent organization witness the Capability Test, therefore the offeror needs to notify the Government or its designated representative in writing that the system is ready to begin the CT at least 14 calendar days prior to that event. The Government shall have a maximum of five (5) working days to approve start of CT. A sample of the types of tests that are typically conducted as part of the CT Plan are as follows:

1) Network Capabilities:

a). Demonstrate access to a computer system outside of the domain local to the MSRC but on DREN, kftp, and ktelnet from the system under test.

b) Demonstrate access from a computer system outside of the domain local to the MSRC but on DREN, by using a Government-provided account to kftp and ktelnet to the system under test.

c) Demonstrate access to other systems within the MSRC, by using kftp and ktelnet in a pair wise manner from and to the system under test and Government specified systems at the MSRC.

2) Installed System Capabilities:

a). Demonstrate that the aggregate data transfer rate across all disk subsystems is at least xxx MByte/sec. XXX = 100 MB/s + 150 MB/s*(system peak FLOPS/1 teraFLOPS).

b) Demonstrate in a pair wise manner that files can be exchanged among the system under test and Government specified systems at the MSRC without loss of information content.

c) Demonstrate that the compilers (if any) supplied with the system supports all parallel programming models supported by the system.

d) Demonstrate that a program with at least one module from each compiler and assembler provided with the system can be linked in such a way that all modules in the program successfully execute.

e) Demonstrate that the compilers (if any) provided for that system supports a memory layout mechanism which work across multiple CPUs.

f) Demonstrate that the compilers (if any) provided for that system supports a mechanism which partitions work across multiple CPUs. (This may be the same demonstration as the previous one).

g. Demonstrate the extent to which file systems are preserved in such a situation. j). Demonstrate that each software development utility provided with the system will execute with a simple test case or input program.

4. Failure to Successfully Complete Capability Test.

In the event that the installed system does not successfully complete the CT, within five (5) working days, the offeror and/or the Government or the Government's agent shall determine the reason for failure. After correcting the failure in order to achieve a satisfactory result, which may require adding, substituting, or installing requisite hardware, software and performing services at no extra charge to the Government, the Capability Test shall be repeated.

5. Execution of Guaranteed Benchmark Times.

As part of the Capability Test described above, the Government and/or the Government's designated representatives will witness the offeror execute all benchmark programs whose execution times were guaranteed in the proposal for the installed system(s).

a. Benchmark Required Performance:

1) All benchmark programs shall terminate normally, and produce output that satisfies the correctness criteria for that benchmark program. Execution times for the benchmark program and data set combinations applicable to the system under test must meet or be less than the times contained in the offeror's proposal.

2) In the event the required normal termination(s) and correctness criteria satisfaction is (are) not obtained, or the benchmark programs fail to meet or beat the guaranteed execution times during the Capability Test, the system will have failed to successfully complete the CT, and the offeror shall proceed as described in paragraph 4 above.

3) Benchmark program/data set combinations applicable to demonstration of the guaranteed execution times for both the interim system and the final system in a phased delivery must be rerun on the final system completing a phased delivery. Both sets of benchmark program/data set combinations must demonstrate the guaranteed execution times as contained in the proposal. In the event that such execution times are not demonstrated, the system will have failed to successfully complete the CT, and the offeror shall proceed as described in paragraph 4 above.

b. Files and Data Sets:

The benchmark programs and data sets will be the same ones previously provided by the HPCMP in the initial RFQ.

6. Acceptance.

a. The offeror is responsible for the preparation and submission of DD Form 250, Material Inspection and Receiving Report. Formal acceptance of equipment by the Government's designated representative (for receiving) and Contracting Officer , (for formal acceptance) upon successful completion of the Effectiveness Level Test and Government inspection, as specified in the preceding paragraphs, will be acknowledged on the face of the required Material Inspection and Receiving Report, DD Form 250. No payment shall be made on delivered hardware or software without formal acceptance being made by the Contracting Officer acknowledging such acceptance by their signature on the face of the above referenced Material Inspection and Receiving Report, DD Form 250.

b. Upon formal acceptance of equipment by the Government as defined above, the offeror shall be entitled to receive 75% of the price of the accepted equipment. The balance of that price shall be paid after the system has been placed in production operation within the HPCMP Center environment for a minimum of 30 days while maintaining the proposed effectiveness level and operational interrupt levels.

c. In a phased delivery, each phase of the system will be accepted separately.

7. Acceptance of Additional Equipment.

Any equipment or software added, substituted, or installed to fulfill the performance guarantees contained in the offeror's proposal shall be subject to the same acceptance criteria of this attachment.

ATTACHMENT 3

WARRANTY AND MAINTENANCE

1. Defective Parts Retention.

Once installed in a system at an MSRC, defective parts (e.g. magnetic media, semiconductor devices, etc.) that contain any data will be retained by the Government. The Government, at its option, may permit degaussing and/or declassification of such devices in accordance with approved, verifiable procedures for return to and re-use/disposal by the offeror. However, the Government reserves the right to retain these devices permanently or to destroy them, regardless of warranty or maintenance coverage for these devices. The Government shall incur no additional costs related to retention of such parts.

2. Warranty.

a. Any provided warranty shall commence on the next day after successful completion of acceptance testing. Any maintenance (to include parts) performed prior to or during the warranty period shall be furnished at no cost to the Government.

b. Prior to the expiration of the warranty period, whenever equipment is shipped for mechanical replacement purposes, the offeror shall bear all costs, including, but not limited to, costs of packing, transportation, rigging, drayage and insurance.

c. The warranty shall not apply to maintenance required due to the fault or negligence of the Government or acts of God/nature.

d. The effectiveness level of each system during the warranty period shall be computed separately, on a month by month basis, using the formula and definitions for effectiveness level (EL) in paragraph 2c. of Attachment 2.

e. The offeror shall maintain equipment provided in response to this proposal during the warranty period at a monthly effectiveness level of 97% (or higher if proposed by the offeror and a minimum number of operational interrupts per month consistent with guarantees offered by the offeror. If the monthly effectiveness level for a system/equipment drops below those levels, or if the number of operational interrupts exceeds the maximum guaranteed, the offeror shall grant the Government a consideration in the form of 100% of one month's (post warranty) maintenance charges. Note that the offeror needs to prepare a clear definition of the incident count and what it applies to.

f. If the offeror provides warranty coverage which doesn't fully meet the requirements of the HPCM program, a cost to meet that coverage during the warranty period should be included in the response to the RFQ as shown in paragraph 2b of General Information above.

3. Hardware Maintenance.

a. On an as-required basis, the offeror shall provide remedial and preventive hardware maintenance for all equipment provided in response to the proposal, and for systems upgraded or expanded in response to the proposal.
b. Offeror maintenance personnel shall interact with designated Government and the Government's agent points of contact to facilitate equipment maintenance.

c. The offeror shall provide all labor, documentation, spare and repair parts, maintenance supplies, tools, diagnostics, and test equipment necessary to promptly and efficiently ensure that the equipment is restored to such a state that it is in nominal operating condition.

d. The offeror shall attempt to minimize the risk of loss of Government data while performing remedial and preventive hardware maintenance.

e. Offerors must notify the Government of any requirement for on-site storage of parts. Without such notification and concurrence by the Government to supply such storage facilities, the Government will assume no requirement for on-site parts storage.

4. Remedial Maintenance.

Remedial maintenance shall be performed in accordance with the terms of the proposal. The Principal Period of Maintenance (PPM) shall be 24 hours per day, seven days a week, including holidays. Remedial maintenance shall be required when the Government's designated COTR, the Government's agent, or other authorized personnel, makes an entry in the System Maintenance Event Log for the MSRC recording that the system is not available for use, and notifies the offeror in accordance with previously established and mutually agreed to procedures.

"Not available for use" may include degradation in system performance or from conditions where full system functionality is not being provided. Examples would include, but not be limited to, inoperable processors, memory, on-line storage, network interfaces, or input/output paths/subsystems. System functionality includes all system capabilities and operating characteristics that are normally available for use by the HPCMP users.

When remedial hardware maintenance is required, the response time shall be within two hours. Response time begins at the time the offeror is notified that an event has been recorded in the system maintenance event log and proceeds until corrective actions are initiated by the offeror. Copies of the System Maintenance Event Log shall be provided to the Government's COTR upon request, and may be used by the Government to establish the times used in computing the monthly effectiveness level.

1) The effectiveness level of each system shall be computed separately, on a month by month basis, using the formula and definitions for effectiveness level (EL) of paragraph 2c. of Attachment 2.

2) The offeror shall maintain equipment provided in response to this proposal during the post-warranty period at a monthly effectiveness level of 97% (or higher if proposed by the offeror and a minimum number of operational interrupts per month consistent with guarantees offered by the offeror. If the monthly effectiveness level for a system/equipment drops below those levels, or if the number of operational interrupts exceeds the maximum guaranteed, the offeror shall grant the Government a consideration in the form of 100% of one month's (post warranty) maintenance charges.

5. Preventive Maintenance.

1) The offeror shall work with Government COTR or designated representative to establish a mutually agreeable schedule for PM. At the discretion of the Government, any time for which the system is not operationally usable during a PM period may be deducted from the operational use time for the purposes of the effectiveness level calculation and may be counted as an operational interrupt. See Attachment 2 for additional clarification of operational use time and effectiveness level.

2) The Government requires that all manufacturer-sponsored Engineering Changes (ECs) issued prior to acceptance be incorporated into any equipment provided by the offeror. After the date of acceptance, all future ECs and changes shall be offered to the Government by the offeror within 60 days of release by the manufacturer for production use. Those ECs and changes required to correct safety hazards shall be offered to the Government within one day's notification to the offeror by the manufacturer that such an EC or change is available for production use. It is understood that a rejected EC may have to be accepted at a later date if it is required as a prerequisite to a future accepted EC. The offeror shall notify the Government of all ECs prior to commencing installation of the ECs. All manufacturer-sponsored ECs, except changes required to correct safety hazards, shall be subject to approval by the Government's COTR or designated representative prior to commencing the equipment modification. Notification shall include a description of the EC or change, the equipment it applies to, and a recommendation as to whether or not it should be installed. ECs and changes required to correct safety hazards shall be obtained from the manufacturer and installed in a timely manner by the offeror during periods of preventive maintenance.

6. Software Maintenance.

The offeror shall provide on-site software maintenance in accordance with previously established and mutually agreed to procedures for all software provided by the offeror.

a. The offeror shall perform the initial software installation and configuration of all offeror provided software.

b. The offeror shall maintain compliance with all hardware and other software specifications with any new software releases installed.

c. The offeror shall obtain from the manufacturer or developer all new releases of off-the-shelf software originally provided by the offeror, including subroutine libraries, together with installation instructions and associated documentation. These releases shall be offered to the Government by the offeror not later than 60 days after commercial availability of such releases. for. The offeror shall install the new release, dependent on the prior installation of any requisite hardware and subject to approval by the Government's COTR or designated representative prior to installation. The term "releases" shall be considered to include corrections (AKA "bug fixes"), revisions, updates, extensions, improvements, new versions, and new library language bindings for any compilers originally provided by the offeror. New releases shall contain all previous fixes. New releases shall be tested prior to release for general use, to ensure successful implementation when released. Such testing shall be coordinated with the Government's integrating contractor and performed at such times as to provide minimal user impact.

d. The offeror shall notify the Government's COTR or designated representative of all security alerts that apply to operating systems and associated software and utilities provided or maintained by the offeror, within one day of their release. Any resulting change to operating systems and associated software and utilities provided or maintained by the offeror shall be submitted to the Government's COTR or designated representative for approval, with installation instructions and associated documentation.

e. The offeror shall attempt to minimize the risk of loss of Government data while performing software maintenance.

ATTACHMENT 4

MSRC NETWORKING INFRASTRUCTURES

A. Existing networking infrastructure at ARL:

For additional information on the existing infrastructure at the ARL MSRC contact _____.

Note: As noted earlier, the names of the DoD HPCMP Office and Center representatives have been removed from this web-page version of the TI-04 Phase 2 RFQ for security reasons. Please call the TI-xx Acquisition Team Lead at the DoD High Performance Computing Modernization Program Office, at (703) 812-8205, for the representatives' names.

The ARL MSRC xxxxxxx networking currently uses the following technologies:

	10/100 E/net	ATM	GigE/net
IBM P4	x		x
SGI O3K			x
MSAS		x	x

The ARL MSRC xxxxxxx networking currently uses the following technologies:

	10/100 E/net	ATM	GigE/net
IBM P3	x		x
IBM P4			x
SGI O3K			x
Linux Networx			x
MSAS		x	x

B. Existing networking infrastructure at ASC:

For additional information on the existing infrastructure at the ASC MSRC contact _____ .

The general design approach for networking at the ASC MSRC is to support HPC systems with ATM OC-12, Gigabit Ethernet, and Fast Ethernet interfaces. The ASC MSRC is moving away from HiPPI, FDDI, ATM OC-3, and Ethernet (10 Mbps). For interoperability purposes, the current set of network vendors at the ASC MSRC is as follows:

- Foundry Networks for Gigabit Ethernet and Fast Ethernet switches
- Marconi (Fore Systems) for ATM switches
- Cisco Systems for ATM routing

- Juniper Networks for routing in the core and at the border with DREN

New HPC systems destined for the ASC MSRC should support the following network protocols:

- ATM NICs shall support Classical IP over ATM (CLIP) per RFCs 1577/2225, and
- LAN Emulation (LANE)
- Gigabit Ethernet NICs shall support "jumbo frames" of at least 9000 bytes and
- "standard frames" of 1500 bytes

ASC MSRC's goal is to avoid "network vendor proliferation" and to be able to easily integrate new HPC systems into the existing network environment.

C. Existing networking infrastructure at ERDC:

For additional information on the existing infrastructure at the ERDC MSRC contact _____.

The general design approach for networking at the ERDC MSRC is to support HPC systems with Gigabit Ethernet for interactive access with other MSRCs and interactive user access and internal machine to machine networking. Fast Ethernet interfaces are used for administrative functions.

The ERDC MSRC is currently reducing their dependency on HiPPI, FDDI, ATM (OC-3 and OC-12), and Ethernet (10Mbps). For interoperability purposes, the current set of network vendors at the ERDC MSRC include:

Foundry Networks and Cisco Systems for Gigabit Ethernet, Fast Ethernet, and Ethernet switches

Marconi (Fore Systems) for ATM switches

Cisco Systems and Juniper Networks for external routing

Responses to this RFQ should include at a minimum Gigabit Ethernet NIC(s) supporting jumbo frames of at least 9000 bytes and standard frames of 1500 bytes.

The ERDC MSRCs goal is to avoid network vendor proliferation and be able to easily integrate new HPC systems into its existing environment.

D. Existing networking infrastructure at NAVO:

For additional information on the existing infrastructure at the NAVO MSRC contact _____.

The internal MSRC network is built upon a resilient combination of CISCO GSR routers, Cisco 6500/4507R switching routers, Marconi/Fore ATM switches, and Essential HiPPI switches.

Primary interfaces used for networking include HiPPI, OC-12 ATM, and gigabit ETHERNET. Aggregated backbone traffic is carried on IP-over-SONET (IPOS) and Gigabit Ethernet links within the MSRC.

ATTACHMENT 5

SYSTEMS DESCRIPTIONS FOR QUOTES REQUESTED FROM XXX

Notes:

1. Definitions below represent nominal processor counts for systems requested
2. Systems may be deployed to ARL, NAVO, both, and potentially other HPCMP related activities.

256 processors
512 processors
1024 processors
2048 processors